

CLAIMS

1. A fluid connection assembly comprising:
a housing including a fluid port, and the housing is made of a first material;
5 a tube made of a second material dissimilar to the first material;
a seal located between the tube and the fluid port; and
a retainer to secure the fluid port to the tube.
2. The assembly as recited in claim 1 wherein the first material is plastic and
10 the second material is metal.
3. The assembly as recited in claim 1 wherein the housing is a manifold.
4. The assembly as recited in claim 1 wherein the tube is aluminum.
15
5. The assembly as recited in claim 1 wherein the retainer is plastic.
6. The assembly as recited in claim 1 wherein the fluid port is inserted into the
tube, and the fluid port includes an annular collar and the tube includes a flared end
20 that abuts the annular collar.
7. The assembly as recited in claim 6 wherein the retainer is molded over the
annular collar of the fluid port and the flared end of the tube.
- 25 8. The assembly as recited in claim 1 wherein the fluid port includes at least
one annular recess that receives the seal.
9. The assembly as recited in claim 1 wherein at least one of the fluid port and
the tube includes a locating feature, and the material of the retainer is received in the
30 locating feature to prevent relative rotation between the fluid port of the manifold
and the tube.

10. The assembly as recited in claim 1 wherein the tube is inserted into the fluid port, and the fluid port includes a flared end and the metal tube includes an annular collar, and the annular collar of the metal tube abuts the flared end of the fluid port.
- 5 11. The assembly as recited in claim 1 wherein the tube includes an end having a first inner diameter that is arranged over the fluid port, and the end of the tube is crimped by a crimping tool to have a second diameter that is less than the first diameter.
- 10 12. The assembly as recited in claim 1 wherein the tube is inserted into the fluid port at a joint compressing the seal therebetween, and the retainer is overmolded the joint.
13. A fluid connection assembly comprising:
- 15 a plastic manifold including a fluid port, and the fluid port include an annular collar and an annular recess;
- a metal tube including a flared end, and the flared end abuts the annular collar of the fluid port;
- a seal received in the annular recess of the fluid port, and the seal is located
- 20 between the metal tube and the fluid port; and
- a plastic retainer molded over the annular collar and the flared end to secure the fluid port to the metal tube.
14. The assembly as recited in claim 13 wherein at least one of the fluid port and
- 25 the metal tube includes a locating feature, and the material of the retainer is received in the locating feature to prevent relative rotation between the fluid port of the manifold and the tube.

15. A method of assembling a fluid connection comprising the step of:
attaching a fluid port of a plastic housing to a metal tube;
locating a seal between the metal tube and the fluid port; and
retaining the fluid port to the metal tube.
- 5
16. The method as recited in claim 15 further including the step of inserting the
fluid port into the metal tube.
17. The method as recited in claim 16 further including the step of stopping the
10 step of inserting of the fluid port into the metal tube.
18. The method as recited in claim 15 wherein the step of retaining includes
molding a plastic retainer over a joint of the metal tube and the fluid housing.
- 15 19. The method as recited in claim 15 wherein the step of retaining includes
crimping an end of the metal tube to secure the metal tube relative to the fluid port.
20. The method as recited in claim 15 further including the step of preventing
rotation between the fluid port and the metal tube.
- 20

AMENDED CLAIMS

[received by the International Bureau on 20 December 2004 (20.12.04)
original claims 1, 9 and 15 amended , original claim 20 cancelled

1. A fluid connection assembly comprising:
a housing including a fluid port, and the housing is made of a first material;
5 a tube made of a second material dissimilar to the first material;
a seal located between the tube and the fluid port;
a retainer to secure the fluid port to the tube; and
a locating feature to prevent relative rotation between the fluid port of the housing
and the tube.
10
2. The assembly as recited in claim 1 wherein the first material is plastic and the
second material is metal.
3. The assembly as recited in claim 1 wherein the housing is a manifold.
15
4. The assembly as recited in claim 1 wherein the tube is aluminum.
5. The assembly as recited in claim 1 wherein the retainer is plastic.
- 20 6. The assembly as recited in claim 1 wherein the fluid port is inserted into the tube,
and the fluid port includes an annular collar and the tube includes a flared end that abuts
the annular collar.
7. The assembly as recited in claim 6 wherein the retainer is molded over the annular
25 collar of the fluid port and the flared end of the tube.
8. The assembly as recited in claim 1 wherein the fluid port includes at least one
annular recess that receives the seal.

30

9. The assembly as recited in claim 1 wherein at least one of the fluid port and the tube includes the locating feature, and the material of the retainer is received in the locating feature to prevent relative rotation between the fluid port of the housing and the tube.

5

10. The assembly as recited in claim 1 wherein the tube is inserted into the fluid port, and the fluid port includes a flared end and the metal tube includes an annular collar, and the annular collar of the metal tube abuts the flared end of the fluid port.

10 11. The assembly as recited in claim 1 wherein the tube includes an end having a first inner diameter that is arranged over the fluid port, and the end of the tube is crimped by a crimping tool to have a second diameter that is less than the first diameter.

12. The assembly as recited in claim 1 wherein the tube is inserted into the fluid port
15 at a joint compressing the seal therebetween, and the retainer is overmolded the joint.

13. A fluid connection assembly comprising:

a plastic manifold including a fluid port, and the fluid port include an annular collar and an annular recess;

20 a metal tube including a flared end, and the flared end abuts the annular collar of the fluid port;

a seal received in the annular recess of the fluid port, and the seal is located between the metal tube and the fluid port; and

25 a plastic retainer molded over the annular collar and the flared end to secure the fluid port to the metal tube.

14. The assembly as recited in claim 13 wherein at least one of the fluid port and the metal tube includes a locating feature, and the material of the retainer is received in the locating feature to prevent relative rotation between the fluid port of the manifold and the
30 tube.

15. A method of assembling a fluid connection comprising the step of:
attaching a fluid port of a plastic housing to a metal tube;
locating a seal between the metal tube and the fluid port;
retaining the fluid port to the metal tube; and
5 preventing rotation between the fluid port of the plastic housing and the metal
tube.
16. The method as recited in claim 15 further including the step of inserting the fluid
port into the metal tube.
- 10 17. The method as recited in claim 16 further including the step of stopping the step
of inserting of the fluid port into the metal tube.
18. The method as recited in claim 15 wherein the step of retaining includes molding
15 a plastic retainer over a joint of the metal tube and the fluid housing.
19. The method as recited in claim 15 wherein the step of retaining includes crimping
an end of the metal tube to secure the metal tube relative to the fluid port.

20